

**The Crinoid *Marsupites*, and A New Cirripede from the Upper Cretaceous of Western Australia,** by **Thomas H. Withers, F.G.S.**

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THE CRINOID MARSUPITES IN THE UPPER CRETACEOUS OF WESTERN AUSTRALIA.

Up till 1924 the exact age of the Cretaceous deposits occurring at Gingin, Western Australia, was in doubt, but the discovery in those beds of the crinoid *Uintacrinus*, enabled me to conclude (Withers, 1924, Jour. Roy. Soc. W. Australia, XI, No. 2, p. 18) that they were equivalent in age to the Santonian or Middle Senonian of the European Cretaceous. *Uintacrinus* has since been found by Mr. L. Glauert, F.G.S., at One Tree Hill, and Mole Cap Hill, at Gingin, and at Round Hill, Dandarragan, some fifty miles north of Gingin.

This discovery has stimulated further work on these deposits, and among the many interesting fossils that Mr. Glauert has since collected are a number of plates of the unstalked crinoid *Marsupites*. These were found in association with plates of *Uintacrinus* at the three above-mentioned localities and at "Compton's Chalk," Gingin. The association of these two crinoids seems to dispose of any possible doubt that the beds are equivalent in age to the *Marsupites*-zone of the European Cretaceous. It would seem also that they agree in age with some part of the Arrialoor Group of Southern India, in which *Marsupites* has been found.

First made known from the English chalk, *Marsupites* was later shown by Rowe and Sherborn (1900, "The Zones of the White Chalk of the English Coast," Pt. I, Kent and Sussex, Proc. Geol. Assoc. London, XVI, pt. 6, pp. 294, 347), to have a definite and restricted range in the Upper Chalk. It occurs commonly in a belt of chalk, bounded above by the zone of *Actinocamax quadratus*, and below by the *Uintacrinus* band. This distribution is apparently common to the whole of the European Cretaceous.

We know now that these two crinoids occur associated in Western Australia, and it is therefore curious that while *Uintacrinus* occurs so commonly over a wide area in the Upper Cretaceous beds of Kansas, U.S.A., no trace of *Marsupites* has yet been found. *Marsupites* does, however, occur in N. America, for two specimens, one a fairly complete calyx, have been described as *M. americanus* by Springer (1911, p. 160, pl. vi, figs. 4a, b, 5), and by Clark and Twitchell (1915, p. 39, pl. vii, figs. 2a, 2b, 3). This form was found in the Tombigbee Sandstone of the Eutaw Formation of Plymouth Bluff, Northern Mississippi.

Besides the present occurrence in Western Australia, and that just mentioned in North America, *Marsupites* has been recorded from England (Rowe and Sherborn, 1900, pp. 294, 347), France (Filliozat, 1906, p. 259, 1908, p. 255, 1910, p. 728; Janet, 1906, p. 244; and Leriche, 1905, p. 50), Germany (Roemer, 1840, p. 27, 1854, pp. 196, 232; Hosius, 1860, p. 74; and Strombeck, 1863, p. 132), Sweden (Schlueter, 1897, p. 46), Russian Poland (Pusch, 1837, pp. 9, 10, pl. ii, fig. 9), Algeria (Peron, 1899, pp. 510-11, fig.), and India (Stoliczka (1873, pp. 53, 54). Its occurrence in India seems to have been overlooked, notwithstanding that the specimens were described and figured by Stoliczka in 1873 (pl. vii, figs. 41, 42, 43); these came from the Arrialoor group of Arrialoor and Olapaudy, Southern India.

***Marsupites testudinarius*** (v. Schlotheim).  
(Plate XI, figs. 7-11.)

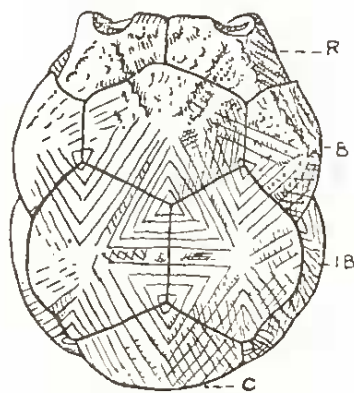


FIG. 1.—*Marsupites testudinarius* (v. Schlotheim). (After Bather.)  
Middle Senonian (Santonian), Dorset, England.  
Cup from the side, showing the character of the ornament.  
Two-thirds natural size.  
C, central plate; IB, infra-basals; B, basals; R. Radials.

The early synonymy of this form is given by Bather (1889), and there seems little doubt that the opinion expressed by him that the forms all belong to a single variable and widely-distributed species, is well founded. It is true that Springer (1911) later

described the American form as a distinct species under the name *M. americanus*. He says, however, (p. 160), "The only real difference observable in the parts preserved is that in our species the brachials are shorter and wider than in *M. testudinarius*, and if we had enough specimens with brachials attached to get an average, this might disappear." Further, "As in *Uintacrinus*, the resemblance between the American and European forms is very great, and they may even be of identical species."

The material from Western Australia consists only of detached and slightly worn cup-plates. One (Pl. XI, fig. 10) is apparently a radial, and two others (Pl. XI, figs. 9, 11) probably represent basals. The weathered plate (Pl. XI, figs. 7-8) shows well the structure of the stereom, the inner layer (fig. 8) having been partly removed.

All the plates so far found are of the smooth type, but it is quite possible that further collecting will bring to light strongly ribbed plates, such as are found associated with the smooth type in the English chalk. In themselves, these plates are insufficient to throw any light on the question as to whether there is more than one species of *Marsupites*. On the other hand, they do not show any differences that are not covered by the range of variation in specimens of *M. testudinarius* from the English chalk. The Australian plates are therefore here referred to the same species.

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A NEW CIRRIPEDE FROM THE UPPER CRETACEOUS OF WESTERN AUSTRALIA.

Since the publication of my paper (1924, Journ. Roy. Soc. W.A., X, Pt. ii, p. 64) on the Cirripede *Calantica* (*Scillaelepus*) *ginginensis* (Etheridge, jun.), Mr. L. Glauert, F.G.S., has sent to me from time to time further Cirripede remains which he has collected in the Upper Cretaceous (Santonian) beds in the neighbourhood of Gingin, Western Australia. These remains come from One Tree Hill and Mole Cap Hill, at Gingin, and others come from the same horizon at Round Hill, Dandarragan, some fifty miles north of Gingin. Nearly all belong to the above-mentioned species.

A very interesting new species, the second species of Cirripede to be described from the Cretaceous of Australia, is represented by two terga from Dandarragan, and a scutum from One Tree Hill probably belongs to the same species. The terga are V-shaped owing to the deep emargination of the scutal side of the valve, and they evidently belong to some Scalpelliform barnacle in which decalcification of the valves has set in. Among recent forms there is a tendency towards decalcification of the valves, and this occurs in more than one stock, but it is as interesting as it is unexpected, to find it had already appeared in the Upper Cretaceous.

SCALPELLUM Leach, 1817.

Sub-genus **Neoscalpellum** Pilsbry, 1907.

Valves only partly calcified, the calcareous part of the tergum V-shaped; infra-median latus narrow, higher than wide; scutum with apical umbo.

Subgenotype **Scalpellum dicheloplax** Pilsbry.

Most of the recent species of Scalpelliform barnacles showing imperfect calcification of the valves are grouped in the sub-genus *Neoscalpellum* of the genus *Scalpellum*. It seems very probable, however, that imperfect calcification of the valves appeared in different stocks at different times, and the occurrence of this form in the Upper Cretaceous shows that the tendency occurred early in the group. The grouping of these forms does not seem to be a natural one, but to draw attention to this Cretaceous form, it is included in *Neoscalpellum*.

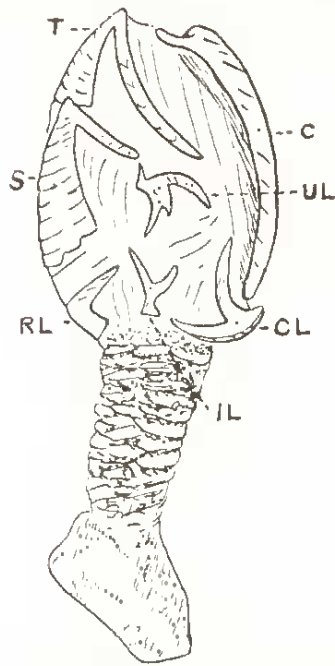


FIG. 2.—*Scalpellum* (*Neoscalpellum*) *dicheloplax* Pilsbry.  
(After Pilsbry). Recent. Lateral view of holotype.  
Two-thirds nat. size.

C, carina; CL, carinal-latus; IL, infra-median latus;  
RL, rostral-latus; S, scutum; T, tergum; UL, upper latus.

In the tergum of any Scalpellid barnacle, the scutal margin is hollowed out to some extent, and this varies in the different species, so that a deep emargination of the scutal margin is not an unexpected modification. The present terga are normal in growth to about half their length, and then there is an abrupt change of growth, the emargination of the scutal margin becoming rapidly deeper. In its early stage the valve is very like that of *Calantica* (*Scillaelepas*) *ginginensis*, for it has a similar, wide, flat-topped ridge as in that species, and, in fact, at the base the whole of the carinal limb of the valve is formed by the ridge. This wide, flat-topped ridge is characteristic of *Scillaelepas*, and it may be that the present form is a derivative from some species of *Scillaelepas* such as *C. (S.) ginginensis*.

***Scalpellum* (*Neoscalpellum*) *glauerti* sp. n.**  
(Plate XI, figs. 1-6.)

*Diagnosis*.—Tergum V-shaped, with a prominent, wide, flat-topped apico-basal ridge, forming almost the whole of the base of the carinal limb of the valve.

*Distribution*.—Upper Cretaceous, Middle Senonian (Santonian); Round Hill, Dandarragan, 50 miles north of Gingin, Western Australia. Also probably at One Tree Hill, Gingin.

*Material*.—Two right terga. One, the holotype (Pl. XI, figs. 3, 4) is in the Western Australian Museum, registered 4194, and the

other (Pl. XI, figs. 5, 6) in the Geological Department of the British Museum, registered In. 25,978. A scutum referred provisionally to this species (Pl. XI, figs. 1, 2) is in the Western Australian Museum, registered 4461.

*Measurements.*—The holotype is complete and has a length of 17.8 mm. and a breadth of 11 mm. The paratype has an incomplete length of 19.7 mm. The scutum has a length of 22.5 mm., and a breadth of 8.8 mm.

*Description.*—Tergum V-shaped. with a prominent, wide, flat apico-basal ridge, sloping towards the scutal side, and widening gradually towards the basal angle, which is obliquely truncated. Upper carinal margin short, little more than one-third the length of the lower carinal margin. Scutal margin deeply excavated, leaving a narrow limb of the valve on the ocludent side, and this is only a little wider than the carinal limb. In the larger valve the carinal limb is rather narrower than in the smaller valve, and is only about the width of the wide apico-basal ridge. These terga vary also in that the smaller tergum has the carinal limb inclined away from the carinal margin, while in the larger valve it is inclined towards the carinal margin; this influences the curvature of the apico-basal ridge and of the lower carinal margin. The emargination of the scutal margin abruptly takes place in the lower half of the valve, for the earlier stages of growth are quite normal. The outer surface is marked by obscure longitudinal ridges.

A scutum from the same horizon as the above terga, but occurring at One Tree Hill, Gingin, may, in the absence of further evidence, be referred to this species. It has the following characters:—

Scutum thick, surface with slightly raised growth-ridges, crossed by obscure longitudinal ridges; triangular, much elongated; strongly convex transversely, rather more steeply on the ocludent side; umbo apical. Ocludent margin slightly convex; tergal margin slightly convex; basal margin convex, and extending upwards in a wide curve to the tergal margin. On the inner surface the pit for the adductor muscle is large and deep, and takes up almost the whole of the lower half of the valve. The inner ocludent edge stands out prominently and is much produced just below the apex; owing to the prominence of this ridge at the apex, there is a deep triangular depression on the tergal side presumably for the reception of the scutal angle of the tergum; the ocludent edge is divided by a deep, narrow, longitudinal furrow for the whole length of the valve.

*Remarks, and comparison with other species.*—Since this type of tergum is unknown among Cretaceous and later fossil species, it cannot be compared with any, and from the recent species it appears to differ in the presence of the wide, raised, apico-basal ridge.

There is no direct evidence for the reference of the scutum to the same species as the terga, and it shows no sign of decalcification; its narrowness suggests such a probability, however, even apart from the agreement in ornamentation, and the association in the same beds of such large valves. This scutum somewhat resembles the elongate scutum believed to have come from the Lower Chalk of Stoke Ferry, Norfolk, and named by Darwin *Pollicipes acuminatus* (1851, Monograph Fossil Lepadidae of Great Britain Pal. Soc. London, p 56, pl. iii, fig 6), although it differs greatly in detail. *P. acuminatus* is markedly curved inwards, and the basal margin much less convex; the basi-lateral angle is acutely angular instead of forming a wide curve, and the valve is much thinner and differs greatly in the details of the inner surface.

## EXPLANATION OF PLATE XI.

*Scalpellum* (*Ncoscalpellum*) *glauerti* sp. n.

Middle Senonian (Santonian): near Gingin, W. Australia.

- Fig. 1. Scutum (right). Outer view. One Tree Hill. W. Austr. Mus., 4461.  
 2. Inner view of same.  
 3. Tergum (right). Outer view. Round Hill, Dandarragan. W. Austr. Mus. 4194.  
 4. Inner view of same.  
 5. Tergum (incomplete right valve). Round Hill, Dandarragan. Brit. Mus. (Nat. Hist.), In. 25,978.  
 6. Inner view of same.

All figures x2 diam.

*Marsupites testudinarius* (v. Schlotheim).

Middle Senonian (Santonian): near Gingin, W. Australia.

- Fig. 7. Worn plate x2 diam. Compton's Chalk. W. Austr. Mus., 3935.  
 8. Inner view of same showing stereom structure.  
 9. Plate (probably basal). x2 diam. One Tree Hill. W. Austr. Mus., 3957a.  
 10. Plate (radial). x1.5 diam. Mole Cap Hill. W. Austr. Mus. 3939a.  
 11. Plate (probably basal). x1.5 diam. Round Hill, Dandarragan. W. Austr. Mus., 4208.